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WHAT IS CLAIMED IS:

1. A toroidal-type continuously variable transmission, comprising:

a casing;

a rotary shaft rotatably supported in the interior of the casing;

a pair of outside disks each including an axial-direction one-side surface having an arc-shaped section, the outside disks being respectively supported on the two end portions of the rotary shaft so as to be rotatable in synchronization with the rotary shaft in a state that axial-direction one-side surfaces opposed to each other;

an inside disk including axial-direction two side surfaces each having an arc-shaped section, the inside disk being supported so as to be rotatable with respect to the rotary shaft in a state that the axial-direction two side surfaces respectively opposed to the axial-direction one-side surfaces of the two outside disks;

support members interposed by two or more between the axial-direction two side surfaces of the inside disk and the axial-direction one-side surfaces of the two outside disks with respect to the axial direction of the toroidal-type continuously variable transmission so as to be swung and shifted about associated pivot shafts disposed at positions twisted with

respect to the rotary shaft;

a plurality of support plates for supporting the pivot shafts disposed on the two end portions of the support members;

a plurality of power rollers each including a peripheral surface formed as a spherically projecting surface and respectively rotatably supported on the associated support plates, the peripheral surfaces of the power rollers being contacted with the axial-direction two side surfaces of the inside disk and the axial-direction one-side surfaces of the respective outside disks;

an actuator of an oil pressure type for shifting the support members in the axial direction of associated pivot shafts;

an actuator body storing the main body portion of the actuator therein;

a pair of support posts including support ring portions, the support ring portions respectively existing in middle portions between the axial-direction two side surfaces of the inside disk and the axial-direction one-side surfaces of the two outside disks,

wherein the respective one-side end portions of the two support posts are connected and fixed to the actuator body in a state that the rotary shaft is inserted through the support ring portions of the two support posts, the axial-direction two end portions of the inside disk are rotatably supported on the support ring portions of the two support posts, and the

support plates are supported on the neighboring portions of the respective two end portions of the two support posts.

2. A toroidal-type continuously variable transmission as set forth in Claim 1, further including a hollow rotary shaft disposed on the periphery of the middle portion of the rotary shaft so as to be rotatable with respect to the rotary shaft,

wherein the inside disk is an integrally-formed output side disk, the base end portion of the hollow rotary shaft is connected to the output side disk so as to transmit the rotation power of the output side disk, the middle portion of the hollow rotary shaft is inserted through the inside diameter side of one of the two outside disks and the leading end portion of the hollow rotary shaft is projected from the axial-direction other end face of the present outside disk, thereby to take out the rotation power of the output side disk.

3. A toroidal-type continuously variable transmission as set forth in Claim 1, wherein the inside disk is an integrally-formed output side disk, an output gear is disposed on the outer peripheral edge of the output side disk, and the rotation power of the output side disk is taken out by the output gear.

4. A toroidal-type continuously variable transmission

as set forth in Claim 1, wherein the rotary shaft, the pair of outside disks, the inside disk, the plurality of support members, the plurality of support plates, the plurality of power rollers, the plurality of actuators, and the pair of support posts are assembled to the actuator body before being stored into the casing.

5. A toroidal-type continuously variable transmission as set forth in Claim 2, wherein the rotary shaft, the pair of outside disks, the inside disk, the plurality of support members, the plurality of support plates, the plurality of power rollers, the plurality of actuators, and the pair of support posts are assembled to the actuator body before being stored into the casing.

6. A toroidal-type continuously variable transmission as set forth in Claim 3, wherein the rotary shaft, the pair of outside disks, the inside disk, the plurality of support members, the plurality of support plates, the plurality of power rollers, the plurality of actuators, and the pair of support posts are assembled to the actuator body before being stored into the casing.

7. A toroidal-type continuously variable transmission as set forth in Claim 4, wherein, in the portion of the casing

that is situated on the lower side when the casing is carried on a vehicle, there is formed an opening; and, an actuator body including a rotary shaft, a pair of outside disks, an inside disk, a plurality of support members, a plurality of support plates, a plurality of power rollers, a plurality of actuators, and a pair of support posts is stored into the casing through the opening, and the actuator body is connected and fixed to the casing.

8. A toroidal-type continuously variable transmission as set forth in Claim 1, being a half-toroidal-type continuously variable transmission in which lines connecting the center axes of the pivot shafts serving as the inclination centers of the power rollers to the rolling contact positions between the peripheral surfaces of the power rollers and the axial-direction side surfaces of the outside and inside disks are free from presenting on the same straight line.

9. A toroidal-type continuously variable transmission as set forth in Claim 2, being a half-toroidal-type continuously variable transmission in which lines connecting the center axes of the pivot shafts serving as the inclination centers of the power rollers to the rolling contact positions between the peripheral surfaces of the power rollers and the axial-direction side surfaces of the outside and inside disks are free from

presenting on the same straight line.

10. A toroidal-type continuously variable transmission as set forth in Claim 3, being a half-toroidal-type continuously variable transmission in which lines connecting the center axes of the pivot shafts serving as the inclination centers of the power rollers to the rolling contact positions between the peripheral surfaces of the power rollers and the axial-direction side surfaces of the outside and inside disks are free from presenting on the same straight line.

11. A toroidal-type continuously variable transmission as set forth in Claim 1, wherein the support members and the power rollers are interposed between the axial-direction one-side surfaces of the pair of outside disks and the axial-direction two-side side surfaces of the inside disk by two at two positions on the opposite side in the diameter direction of the respective disks.

12. A toroidal-type continuously variable transmission as set forth in Claim 2, wherein the support members and the power rollers are interposed between the axial-direction one-side surfaces of the pair of outside disks and the axial-direction two-side side surfaces of the inside disk by two at two positions on the opposite side in the diameter

direction of the respective disks

13. A toroidal-type continuously variable transmission as set forth in Claim 3, wherein the support members and the power rollers are interposed between the axial-direction one-side surfaces of the pair of outside disks and the axial-direction two-side side surfaces of the inside disk by two at two positions on the opposite side in the diameter direction of the respective disks.

14. A continuously variable transmission apparatus, in combination a toroidal-type continuously variable transmission unit with a planetary-gear-type transmission unit, comprising:

an input shaft connected to the rotary shaft of the toroidal-type continuously variable transmission unit; and

an output shaft connected to the composing parts of the planetary-gear-type transmission unit,

wherein the toroidal-type continuously variable transmission unit, comprises: a casing; a rotary shaft rotatably supported in the interior of the casing; a pair of outside disks each including an axial-direction one-side surface having an arc-shaped section, the outside disks being respectively supported on the two end portions of the rotary shaft so as to be rotatable in synchronization with the rotary shaft in a state that axial-direction one-side surfaces opposed to each

other;

an inside disk formed as an integral body or including a pair of elements connected together and including axial-direction two side surfaces each having an arc-shaped section, the inside disk being supported so as to be rotatable with respect to the rotary shaft in a state that the axial-direction two side surfaces respectively opposed to the axial-direction one-side surfaces of the respective outside disks;

support members interposed by two or more between the axial-direction two side surfaces of the inside disk and the axial-direction one-side surfaces of the respective outside disks with respect to the axial direction of the toroidal-type continuously variable transmission so as to be swung and shifted about associated pivot shafts thereof disposed at positions twisted with respect to the rotary shaft;

a plurality of support plates for supporting the pivot shafts disposed on the two end portions of the support members;

a plurality of power rollers each including a peripheral surface formed as a spherically projecting surface and respectively rotatably supported on the associated support plates, the peripheral surfaces of the power rollers being contacted with the axial-direction two side surfaces of the inside disk and the axial-direction one-side surfaces of the two outside disks;

an actuator of an oil pressure type for shifting the support members in the axial direction of the associated pivot shafts;

an actuator body storing the main body portion of the actuator therein;

a pair of support posts each including a support ring portion, the support ring portions respectively existing in the middle portion between the axial-direction two side surfaces of the inside disk and the axial-direction one-side surfaces of the two outside disks,

wherein the respective one-side end portions of the two support posts are connected and fixed to the actuator body in a state that the rotary shaft is inserted through the support ring portions of the two support posts, the axial-direction two end portions of the inside disk are rotatably supported on the support ring portions of the two support posts, and the support plates are supported on the neighboring portions of the two end portions of the two support posts, the planetary-gear-type transmission unit is structured such that the power is transmitted thereto from the rotary shaft and the inside disk of the toroidal-type continuously variable transmission unit, the planetary-gear-type transmission unit includes a switching device for switching the transmission passage of the power into two systems.

15. A toroidal-type continuously variable transmission

as set forth in Claim 14, further including:

a hollow rotary shaft disposed on the periphery of the middle portion of the rotary shaft, and

wherein the planetary-gear-type transmission unit further comprises: a carrier connected and fixed to the pair of outside disks including the toroidal-type continuously variable transmission unit concentrically with the two outside disks and rotating with the both of outside disks;

a plurality of first planetary gears rotatably supported on one of the axial-direction two side surfaces of the carrier opposed to one of the outside disks;

a first sun gear connected to the inside disk by the hollow rotary shaft not only disposed concentrically with the inside and outside disks so as to be rotatable but also meshingly engaged with the first planetary gears;

a plurality of second planetary gears rotatably supported on the other side surface of the carrier;

a second sun gear not only disposed concentrically with the inside and outside disks so as to be rotatable but also meshingly engaged with the second planetary gears; and,

a ring gear not only disposed concentrically with the input side and output side disks so as to be rotatable but also meshingly engaged with the first planetary gears,

wherein the switching device selects a mode for transmitting the power taken out from the inside disk through

the ring gear to the output shaft or a mode for transmitting the power taken out from the inside disk through the second sun gear to the output shaft.